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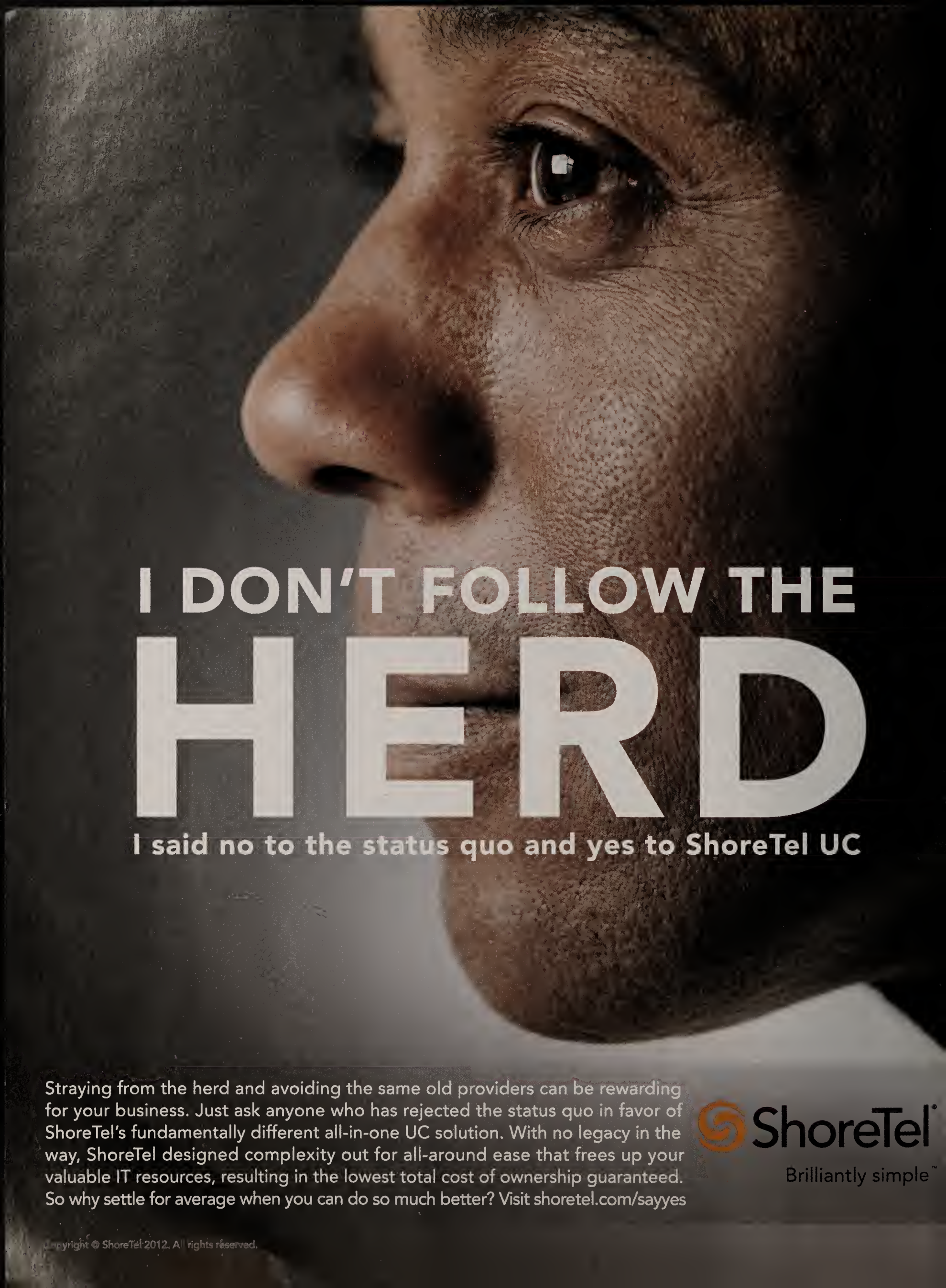
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INNOVATION & BUSINESS VALUE

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COVER STORY CIOs are merging online and offline retail to retain customers and reclaim the shopping experience

BY MARY K. PRATT

Integrating retail silos has required big investments in IT upgrades, says **Keith Sherwell**, SVP and CIO at Sears Holdings.





FROM THE
EDITOR IN CHIEF

start

CHATTER

Convergence Rules

The mere sound of the phrase “omnichannel retail” makes my little shopper’s heart beat faster. And that’s even before I knew exactly what it meant.

“A lot of people will right away start thinking ‘multichannel retailing.’ Omnichannel retailing is different,” says CEO Daniel Burrus of Burrus Research Associates. “Omnichannel is integrated, the other is not.”

But you don’t have to be a bargain-hunting mall maniac to see the potential that the customer-focused concepts laid out in our cover story (“Click and Mortar,” Page 22) hold for industries beyond retail. In exploring the many IT and business complexities of omnichannel approaches, which blend online and offline capabilities, we offer a glimpse into your own company’s likely future.

As retailers begin crafting a single shopping experience across all customer touch points, “you think about inventory as a singular concept versus store or online,” says Kasey Lobaugh of Deloitte Consulting. “It unlocks a ton of value for consumers and for the retailer as well.”

Once the business’s attention converges on everything that affects the customer experience, you’ll find the IT organization in the middle of that bull’s-eye. “Technology plays a massive part in delivering an integrated customer experience,” says CIO Keith Sherwell of Sears. Along with other retailers like The Home Depot, Nordstrom, Lowe’s, Macy’s and Staples, Sears is investing heavily in upgrading or creating the IT systems that will (eventually) make omnichannel strategies a reality. “There’s a lot of this work that has yet to be done,” retail expert Cathy Hotka points out.

Like so many other businesses (media and publishing leap to mind), retailers are getting access to more channels for reaching consumers, but they’re managing those channels separately. Yet customers are starting to move fluidly from smartphones to tablets to PCs to social media and so on, and they want their e-stuff to travel with them.

“Customers are going to define how they want to shop, and if we’re not enabling that, we’ll become irrelevant,” says CIO John Dettenwanger Jr. at Ahold USA. “To me, omnichannel is really about omnipresence. It really flips the view from ‘What’s the advantage to us?’ to ‘What’s the advantage to the consumer?’”

That is one great question for CIOs everywhere to be thinking about. How will this inevitable convergence of customers’ online and offline expectations rule your world?

Maryfran Johnson, Editor in Chief, *CIO Magazine & Events*
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Major League Upgrade

Four years ago, **Major League Baseball** switched to pushing game updates to its website, MLB.com, **in real-time** instead of at the end of each game. The fans loved it, but the change led to workflow problems and a **flurry of email** for Web producers. According to Senior Online Writer Kristin Burnham, MLB.com implemented **Central Desktop**, a collaboration tool that helps manage publishing and production. Workers set up an intranet to access content plans and shared calendars. Most importantly, the platform helped **reduce email by between 60 percent and 70 percent.**
www.cio.com/article/718003

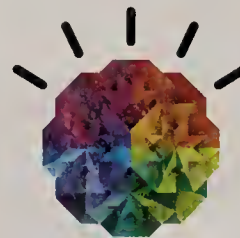
Open Sesame

Good Technology is piloting the use of smartphones with **near-field communications technology** to replace access cards in providing physical access to its offices. Senior Online Writer Al Sacco says the system uses card readers from HID Global and **Samsung Galaxy S III phones** to open doors. Employees in the pilot program say the smartphone is **more convenient and more secure** than a card.
www.cio.com/article/716928

Big Data Directions

A report by TechAmerica Foundation tries to **quiet the buzz about big data** and drill down to what **government CIOs** really need to know, according to Contributing Writer Kenneth Corbin. The report advises CIOs to expect change will be gradual. It also recommends steps federal agencies can take to improve their big data efforts, such as **aligning projects with business objectives** and encouraging more collaboration among agencies.
www.cio.com/article/718005

Compiled by Staff Writer Lauren Brousell. Have a comment about a story in this issue? Go to www.cio.com/issue/20121101 or write to letters@cio.com.



"It's not going to be about tinkering...It's getting back that thirst to make something."



Smith
son IT

which automate processes, speeding up deployments and simplifying management. So you're on to the next thing.

With decades of experience and thousands of deployments in the same industries, on the same topics, even for the same tasks—why is it that organizations are forced to waste massive amounts of time and resources starting from scratch with every new project?

TO READY IN HOURS.

To address this problem, IBM set out to design a system that could benefit from previous experience—a system that could follow the patterns established by successful IT projects to make it simpler to deploy and manage new ones.



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1. Based on a 2011 commissioned study conducted by Forrester Consulting on behalf of IBM. 2. Based upon testing of the IBM PureApplication System W1500-96 with time measured from powering on the system to when it is ready to support application deployments and based upon testing of the IBM PureFlex System Express & Standard models containing one chassis and one compute node with the time measured from powering on the system to when it is ready to support a virtual image deployment. IBM, the IBM logo, ibm.com, PureApplication, PureSystems, Smarter Planet and the planet icon are trademarks of International Business Machines Corp., registered in many jurisdictions worldwide. A current list of IBM trademarks is available on the Web at www.ibm.com/legal/copytrade.shtml. © International Business Machines Corporation 2012.



FROM THE **CEO**

Talent Challenge

The more CIOs I talk to, the more apparent it becomes that the talent wars have hit a whole new level of sophistication. Here are some intriguing approaches and questions to consider, gathered from my most recent CIO conversations:

■ **Establish rotational assignments between IT and business units:** How many of you are currently doing this? If you want your team to have a deep understanding of your business, it's essential to develop deep departmental expertise. Moving your high-performers from group to group can greatly change the organizational mind-set.

■ **Emphasize change leadership over change management:** It's vital for the IT organization to lead during the process of change and transformation. How can IT be the enabler in moving the company from fear of change to embracing it?

■ **Become a talent exporter instead of a talent importer:** You'll know the IT organization is developing and growing its talent when members of your team are tapped to lead new business initiatives. What are you doing today to make your group the model business unit for the company?

■ **Pay real attention to succession planning:** As Jim Collins, author of *Good to Great* and *Great by Choice*, puts it, "We cannot predict the future. But we can create it." How much thought are you giving to the success of your successor? Are you making the time to build a managerial legacy?

■ **Manage remote teams more effectively:** As our work becomes more virtual and mobile, the skill sets needed to manage these teams become far more critical. What are you doing differently to communicate, multitask, collaborate and execute in ways that take advantage of the virtual work environment?

■ **Understand the impact of cultural differences:** The more global your workforce, the more pressing the need to have team members in place who can excel in a culturally diverse business climate. As the core provider of collaboration and communication tools, IT can serve as the global proof-of-concept of how a well-integrated company functions.

I suspect many of these practices are already in use at your organizations, but I'd love to hear from you about what's missing from my list. What are some of your best practices for attracting and growing your top talent?

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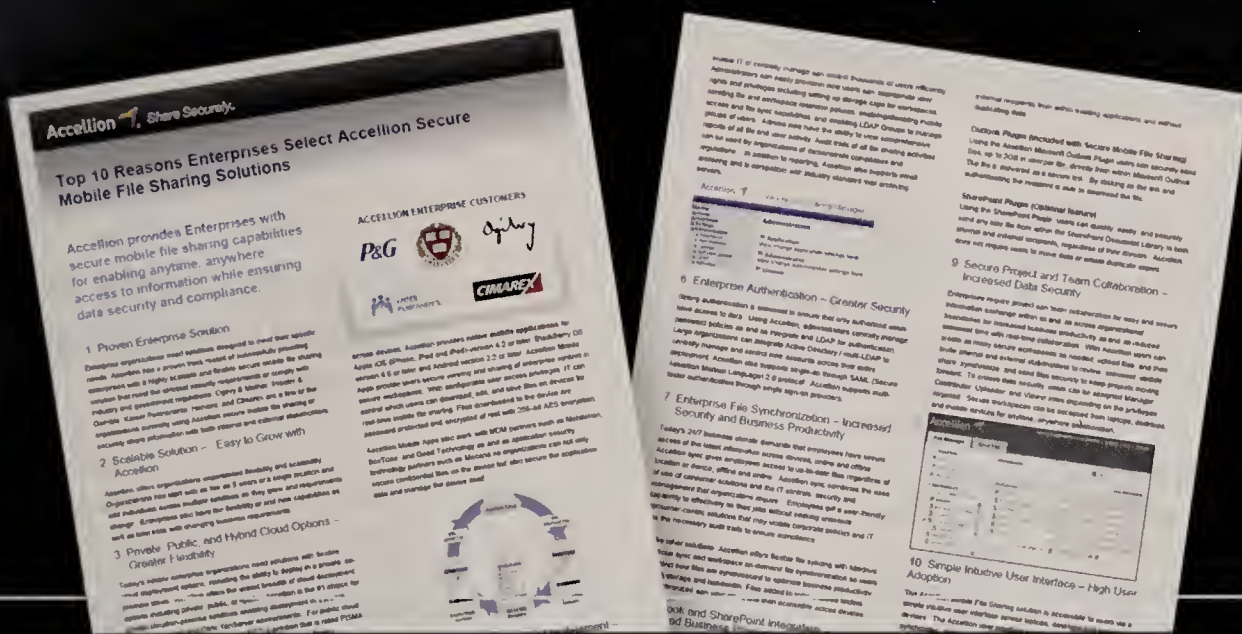
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Perks that Work

Want to improve your employee retention rate? Try these corporate culture strategies.

1 Promote from within. According to Matt Chasen, CEO of Texas-based shipping company uShip, which boasts a 1.5 percent turnover rate, "when people see someone takes on more responsibility and moves [up] quickly, it shows others how to do it."

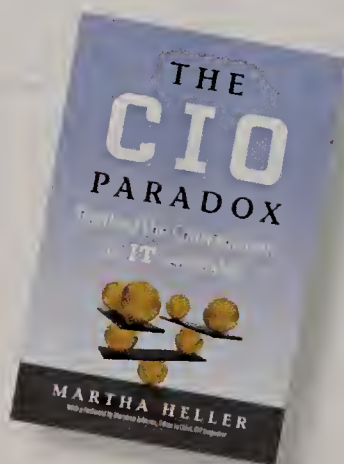
2 Consider fringe benefits. Little things go a long way and can still be cost-effective. uShip employs a full-time chef who makes lunch every day and breakfast on Fridays. According to Chasen, in-house lunches also encourage employees to bond.

3 Use "stay interviews." Most companies perform exit interviews, but these don't tell you how to retain workers. A better question to ask is, why do employees stay?
—Richard Hein

 For more tips, see: www.cio.com/article/717356



WORTH READING



BOOK The CIO Paradox: Battling the Contradictions of IT Leadership

By Martha Heller

Somehow CIOs are supposed to keep legacy systems running and drive business innovation even while they cut costs. Heller, a *CIO* columnist, shares anecdotes and lessons learned from successful CIOs to help readers break out of (or at least manage) the paradox. *Bibliomotion*, \$34.95

quick FIX



How do I deal with difficult colleagues on my team?

ALWAYS remember, once you've characterized someone as a difficult person, you're already in a lose-lose situation for both parties. Instead, think of them as a colleague in a difficult situation. Once you start to think about how to help manage a difficult situation, then your focus becomes positive and constructive instead of critical or complaining. (And remember, at some point you too will be perceived as the colleague with a difficult situation.) This way of thinking can lead to everyone being better satisfied and better served, including you, your colleagues, and your customers.

SOMETIMES you need to shift your perspective. Instead of seeing an angry or upset coworker and not wanting to have anything to do with him, shift your perspective and think, What does this person value that he is not getting? What can I do to help create that missing value? What can I do to step up and serve him better? When everyone in an organization agrees to take action and define service this way, a service culture can grow to deliver better internal service, which leads to better external service.

NEVER behave badly. Be a service role model, especially in difficult situations. Let others see that problems don't need to be painful and emotions don't need to be escalated. Don't let difficult situations consume all your energy, or your entire day. As other people in your organization see that this approach really works, everyone will want to take part and your culture of service will grow stronger.

Ron Kaufman is a keynote speaker and the author of *Uplifting Service: The Proven Path to Delighting Your Customers, Colleagues, and Everyone Else You Meet*.

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Cool Use for Hot Tech

An HVAC company develops an augmented reality app to answer its customers' number-one concern **BY KIM S. NASH**

When your salespeople can't answer the single most frequently asked customer question, no one's happy but your competitor.

Mitsubishi Electric Cooling and Heating sells heating, ventilation and air conditioning (HVAC) systems, and its staff is constantly asked, "What will this thing look like when it's installed?" Salespeople have tried many ways to help customers visualize the installed system, including big sticky notes applied to the wall. Now they've got a better answer: an augmented reality application that displays 3-D images on their iPads so customers can see exactly what one of those giant air conditioners or heaters will look like in their office or living room.

Some companies have dabbled in augmented reality for promotions, including Starbucks, which issued a Valentine's Day app last February that let customers exchange personalized messages via their coffee cups. At Mitsubishi Electric, the apps help sell products and improve customer satisfaction, says Gabriel Weiss, who leads the interactive marketing technologies group at the company.

... **56%** Companies planning to spend more on e-commerce tech. Forrester Research ... **10%** In 2014, the portion of online reviews that someone will have been paid to write. Gartner ... **96%** Baby Boomers who look for jobs online. Millennial Branding

crunch

The Search for Intelligence

Finance execs want more intelligence data and insights about competitors, customers and business operations. Can CIOs help?



SOURCE: PROTIVITI SURVEY OF 100 FINANCE EXECUTIVES, JULY 2012

"Augmented reality is more than just showing off with technology."

Using IT to make concrete and innovative improvements to the customer experience can pay off in new sales and strong loyalty, says Frank Wander, founder of the IT Excellence Institute, a consultancy.

In the past, Mitsubishi Electric printed life-sized pictures of its products for salespeople to stick onto customers' walls to give a sense of what they would look like. But flat images don't show the whole picture. Some HVAC units are nine inches deep, for example, and customers couldn't easily visualize how far the units would stick out.

Using the augmented reality application on his iPad, a salesman snaps pictures of the customer's room and combines them with stored images of an HVAC model to create a 3-D depiction on the iPad screen. Salesmen can also email 3-D images and video to customers to consult as they weigh whether to buy.

"A brochure doesn't tell the customer what it looks like in their own space. This does," Weiss says.

To administer these and other mobile applications, Mitsubishi Electric initially emailed them to contractors, who had to install them on their devices. Not many bothered because it was time-consuming. This method also meant that Mitsubishi Electric had to email new versions of the apps whenever there was an upgrade and cajole people to install the new versions.

As the number of mobile applications has grown at Mitsubishi, Weiss sought a more efficient method for controlling them. Working with vendor AppCentral, he built a secure enterprise app store. This lets Mitsubishi Electric offer access in a familiar, consumer-like way. It also lets the company control who has access to which software. Internal sales staff get different applications than contractors, for example. An app store also makes it simpler to push out upgrades automatically, Weiss says.

"Augmented reality is more than just showing off with technology."

—Gabe Weiss, Mitsubishi Electric Cooling and Heating

Catering to Rich Heirs

Can wealth-management firms hang on to the next generation of rich customers? Capco, a financial services consultancy, is warning old-school banks that they must improve their digital offerings if they expect to capture the business of the smartphone-wielding offspring of current customers.

Capco calls this the "wealth transfer time bomb" in a new report. "Digitally savvy recipients of inherited wealth will bring a new level of consumer demand for around-the-clock, real-time mobile, tablet and online banking services," says Peter Lewis, a partner at Capco, in a statement. "Without a comprehensive digital offering, [financial institutions] risk losing customers and significant revenue to competitors," he says.

Financial institutions are already finding it hard to meet the "on-demand requirements of generation Y," Capco says.

"An inferior digital experience will push these new digitally weaned clients away as they re-evaluate their wealth services in favor of online and mobile platforms," the report says. "Real-time, accurate information is a must, as is ensuring that the rich dialogue between advisers and clients is not lost."

—Mitch Betts

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Contact Senior Editor Kim S. Nash at knosh@cio.com. Follow her on Twitter: twitter.com/knosh99.

••••• **86%** People over 50 who say technology will help them be safer drivers. MFI ••••• **9%** CIOs who will increase IT staffing in the fourth quarter. Robert Half Technology ••••• **\$5.9B** Amount spent to fix or replace damaged iPhones. squareTrade



Flow

12

BY ADAM HARTUNG

What could be better than end users paying for their own devices? Maybe you can eliminate the budget line for mobile hardware by allowing users to connect to the company's networks with their own smartphones.

If CIOs embrace today's get-it-done-on-my-smartphone world, they are much more likely to beat the competition.

Why not use the cloud? Instead of thinking “proprietary and protected,” think “accessible and available.” Enjoy the advantages of cloud-based data storage and delivery. Push vendors to provide security and reliability—they can do it.

When giving end users more control over technology, demand that they give back performance. Push users to tell IT what apps will make the organization more productive and successful. Set up a team to quickly respond to employee recommenda-

tions for apps the enterprise should use. And if employees don't offer ideas, push them to do so. With empowerment comes responsibility.

Set up a team to push vendors to provide apps that will improve your company's performance. And not just IT vendors. Customer-service vendors should provide apps with real-time data about calls, leads, feedback and performance. Supply-chain vendors should provide real-time data about order status, quality issues, complaints and performance.

IT is increasingly the core infrastructure of all companies. If that infrastructure looks like rails and highways in a world of runways and rocket launchpads, problems are inevitable.

But if CIOs embrace today's cloud-based, always available, get-it-done-on-my-smartphone world, they are much more likely to beat the competition.

Adam Hartung is a consultant specializing in innovation and the author of the book *Create Marketplace Disruption*. Contact him at AdamHartung.com.

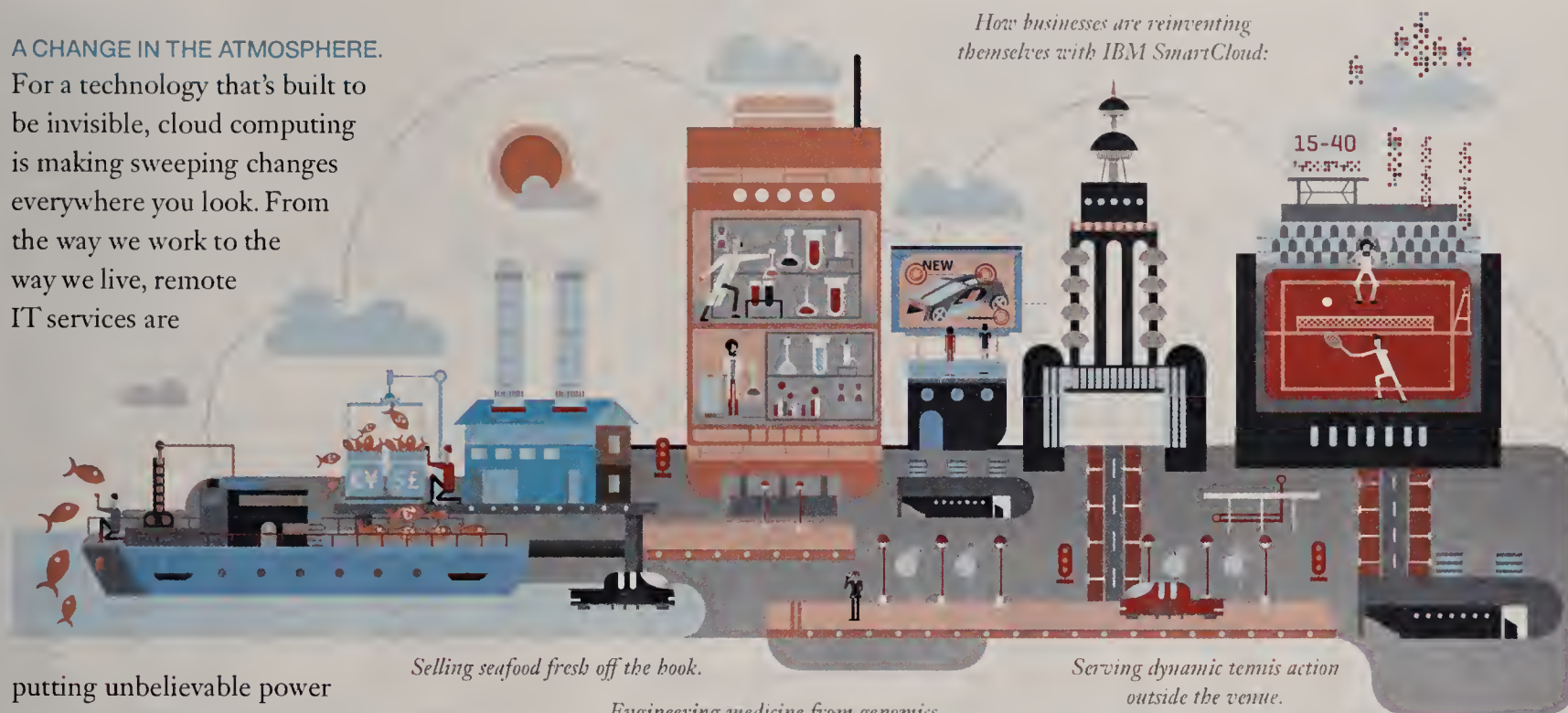
FROM MAINSTREAM



A CHANGE IN THE ATMOSPHERE.

For a technology that's built to be invisible, cloud computing is making sweeping changes everywhere you look. From the way we work to the way we live, remote IT services are

How businesses are reinventing themselves with IBM SmartCloud:



putting unbelievable power right at our fingertips. But while more and more companies are discovering the extraordinary efficiency gains of the cloud, few are aware of how much potential is left untapped.

Selling seafood fresh off the boat.

Engineering medicine from genomics.

Serving dynamic tennis action outside the venue.

TO REVENUE STREAM.



In a recent study, 68% of firms using the cloud to disrupt markets expected to outperform their peers.

YESTERDAY THE BACK ROOM, TOMORROW THE BOARDROOM. At most companies, the cloud is taken at face value—a conduit for increasing flexibility and reducing complexity. Meanwhile, forward-looking businesses are rethinking the cloud to enable them to profit from an explosion of new social, mobile and analytics capabilities. They're transforming business models, disrupting industries and getting to market in no time.

So conversations that were once held only in IT departments are now happening across the C-suite. And rapidly deployable resources like IBM SmartCloud give decision makers plenty to brainstorm about.

"Removing the burden of infrastructure really allows you to focus on improving your strategy and mission."

Marc Hoit, CIO, NC State

CLOUDS BUILT FOR RAINMAKING.

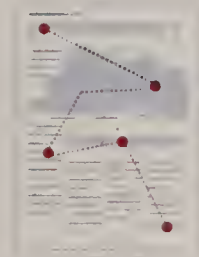
One such example is 3M. These early movers are using the cloud to analyze image design based on eye movement. Graphic artists everywhere can now upload their files and get instant feedback on what will most likely grab viewers' attention. It's a radically different proposition with untold, new market potential.

RETHINK I.T., REINVENT BUSINESS.

In the trends of an expanding digital world, we see a perfect storm of innovation forming. And for today's industrious businesses, the cloud is ready to be capitalized on.

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3M Visual Attention Service is a cloud-based tool for analyzing designs like this ad.



George Kohlrieser,
professor of leadership at
the International Institute
for Management
Development



Engagement Leads to Innovation

Business leaders who care about their employees create a safe haven that fosters productivity and creativity **BY KIM S. NASH**

Psychologist, former hostage negotiator and professor of leadership at the International Institute for Management Development, George Kohlrieser is the co-author of Care to Dare: Unleashing Astonishing Potential Through Secure Base Leadership. He talks about how a respectful, caring workplace produces big innovation gains.

What can leaders learn from hostage negotiators?

As a hostage negotiator, you have to create a relationship with someone you don't necessarily like. And through that relationship, you have to help the person change his mind, convince him to give up weapons and come out, knowing he will probably go to prison. Hostage negotiators have a 95 percent success rate because of the way it's done. Leaders have to be able to show some caring. So does a hostage negotiator. You do it by being interested in the well-being of that person, working toward common, incremental goals. If I have someone in front of me who's an absolute jerk, I have to remember what my role is and what our common goal is. Be immune to criticism. De-escalate their tension so they will cooperate with you.

Why does this approach work?

The idea comes from evolutionary psychology, where we know that the human brain looks for pain and danger in the world, to survive. When a child has a good caretaker and is safe, the child goes out to explore and comes back for protection, energy and comfort. Then he goes out again. That phenomenon remains throughout life. You need secure bases until the day you die.

You say caring leads to daring. How caring should a leader be?

The more the better, within boundaries. It's how you show interest and concern, how you do small things for the people around

you. In customer service, you know when you're dealing with a bureaucrat who is cold and detached, as opposed to someone responsive. Leaders often say, "I don't have time to care." But they're creating a huge, huge problem for themselves. What I'm talking about is engagement. You deal with people respectfully. You can be tough but respectful.

How do you measure the level of caring you've already built?

Measure the engagement of employees. If your immediate boss is caring and gives respect and interest in a variety of ways, then you feel engaged. Engagement is directly linked to productivity. Organizations that measure engagement of over 65 percent are going to make it. If you're under that, you're in big trouble. Caring doesn't mean you're soft or a pushover.

When a
leader creates
a trusting
environment,
the
organization
opens itself to
innovation.

What's the link between caring and innovation?

When a leader creates that trusting environment, the organization opens itself to innovation and creativity, as opposed to being defensive and looking over the shoulder. The kind of caring you provide dares people to challenge themselves and do things they'd never dare to do if they didn't have safety.

Contact Senior Editor Kim S. Nash at knash@cio.com. Follow her on Twitter: twitter.com/knash99.

data for:



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Beyond a Mobile Strategy

Starbucks' chief digital officer focuses on the customer experience first, before developing the technology **BY STEPHANIE OVERBY**

Ask Starbucks' Chief Digital Officer Adam Brotman about the company's mobile strategy and he might very well tell you it doesn't have one. It's an odd-sounding answer from a prime mover in mobility—the \$11.7 billion coffee retailer has been experimenting with mobile technology since 2007 as an early adopter of everything from smartphone payments to mobile ordering.

But “we don't look at mobile in a vacuum,” says Brotman, who joined Starbucks four years ago. “We have an overall digital strategy that's all about building relationships with our customers, and that strategy runs across a number of digital touch points. We're looking at mobile, Web and social to think more holistically about how we engage with our customers and tell our story.”

Starbucks, which had long eschewed traditional advertising in favor of interacting directly with customers through its approximately 149,000 employees, is using digital technology ▶▶



“Customers have embraced what we've done so far, and we have a robust road map of what we want to do next,” says **Adam Brotman**, chief digital officer at Starbucks.



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►► **Mobile** Continued from Page 16

to reach out to its customers even more directly and personally. And, it seems, there's nothing more personal than a customer's mobile device. "It is literally an extension of a person. They always have it with them," Brotman says. "And there are a number of native capabilities in mobile devices that a desktop doesn't have. In some cases, it's the only platform, by definition, capable of doing things like mobile payment and geo-centric targeted communications."

The company has been moving fast and furiously into a number of mobile applications and partnerships in recent years. Its own app includes a 2-D barcode scanning system for mobile payments—which quickly became one of the most widely used in the country, with more than 70 million U.S. payments to date—as well as loyalty card information, store finders and personalized information about what's happening in a customer's local store or what the company is doing in his or her community.

For Starbucks, the early adoption of mobile technology has been less risk than requirement. "The combination of our brand, our customer demographics, our footprint and our frequency make mobile a natural fit," Brotman says. But there are challenges inherent to mobile development. It requires discipline and strict attention to quality assurance when choosing, for example, which platforms to support and which features to roll out first. Then there are the security considerations involved in dealing with mobile payment and customer account information.

But the biggest challenge "is just being realistic about what we can actually accomplish at one time," says Brotman, who oversees the digital strategy for 18,000 retail locations in 60 countries.

"Customers have embraced what we've done so far, and we have a robust road map of what we want to do next." The trick to keeping up the pace is that there is none, he says. "It's just a lot of hard work—sitting down cross-functionally, getting aligned [with] our priorities and the resources available, and working our way through it."

It's critical to resist the urge to put technology first in the quickly evolving mobile arena, Brotman says. "You have to start with the customer and what you're really trying to do from a customer-relationship perspective. Then you can work backward to what the user experience will be, and then work backward from that to develop a technical solution."

Stephanie Overby is a freelance writer based in Massachusetts.

Even Free Apps Create Headaches

BY JEFF VANCE

Rogue apps packing malware are a major concern for CIOs with bring-your-own-device (BYOD) programs. But malware-free apps can pose risks, too. Even in curated app marketplaces, mobile apps can be intrusive. Earlier this year, Apple, Facebook, Yelp and other firms were sued for privacy-infringing apps that, among other things, raided users' address books.

At the time, security experts warned that this was just the tip of the iceberg. A recent study by Appthority, a mobile security vendor, found free apps to be especially likely to access sensitive information and therefore carry the highest risks. For example, what if the app uploads a sales rep's contact list and the developer sells it to a competitor? That's a new type of data leakage that most organizations aren't ready for.

The Healthcare Challenge: Despite such concerns, Riverside Medical Center in Illinois believed trying to prohibit user devices would be counterproductive. "For a hospital like ours, BYOD is a marketing issue as much as it is a security one," says Erik Devine, Riverside's CISO. "If doctors can't use their tablets or smartphones at this hospital, they'll start checking their patients into other ones."

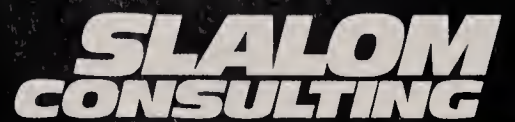
To take part in the BYOD program, end users must agree that Riverside has the right to remotely wipe the device if any problems arise. That could mean wiping a user's photos or personal emails, but that's the risk they must take if the enterprise is going to cope with BYOD risks.

For corporate-owned devices, of course, risks are easier to manage. "If we decide to purchase an iPad for someone, when it's a pure work tool you can't even get to the [Apple] App Store," Devine says. But good luck telling that to an employee shelling out \$80 a month on an expensive data plan.

A Layer of Security: For the time being, most enterprises that want controlled app portals have to build their own, as Riverside did. Clamping down on apps is just part of the equation, though. In addition, the hospital uses a combination of McAfee's Enterprise Mobility Management (EMM) software and Fortinet's application firewall to minimize mobile risks. EMM gives Riverside the ability to detect jail-broken devices, enforce policies like two-factor authentication, and remotely wipe devices if they are lost or stolen.

And because the threats are always evolving, Riverside also relies on Fortinet's behavioral analysis capabilities to see exactly what users are doing with their devices.

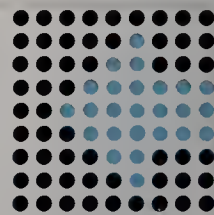
Jeff Vance, a freelance writer for CIO.com, is based in California.



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Cloudy Clients

Citrix has ambitious plans to offer personalized Windows desktops as a cloud service, but there are security concerns **BY MIKAEL RICKNAS**

THE PITCH

Citrix is focused on helping enterprises deal with the challenge of running desktops and applications in a new mobile-centric world where tablets and smartphones proliferate.

"The technologies that we have, including application and desktop virtualization, allow companies to deliver applications to any type of device with control and security," says CTO Martin Duursma.

In addition, Citrix will be rolling out Project Avalon, which aims to transform any Windows application or desktop into a cloud service that's delivered across any network, to any device. It will also offer integrated management.

"Just like cloud platforms allow enterprises to industrialize the way that enterprises do compute and storage workloads, Avalon is bringing some of that technology to Windows applications and desktops," says Duursma.

THE CATCH

Citrix's biggest strength is that it offers multiple delivery models for applications and desktops. But that flexibility comes at a cost, since enterprises have to use multiple consoles to manage those technologies. That is Citrix's biggest weakness, according to Brett Waldman, an analyst at IDC (a unit of CIO's parent company).

Nathan Hill, an analyst at Gartner, agrees: "The feedback we are getting is that it can still be quite complex to configure and deploy a Citrix architecture."

Project Avalon aims to fix this. A recent IDC report said that the cloud offering "will finally bring a unified interface to managing the different client virtualization products Citrix has created or acquired." But it remains to be seen how well Citrix

can execute that vision.

While there is a lot of customer interest in running desktops in the cloud, software licensing has to change. "One of the big barriers to any service provider trying to offer a virtualized desktop service is how Microsoft licenses access to a Windows OS," Hill says.

THE SCORE

Citrix claims that Project Avalon will allow CIOs to rapidly deploy personalized Windows applications and desktops in a private cloud across multiple sites, and to use public clouds in a capacity-on-demand fashion to support business initiatives such as business continuity, offshoring projects, or integrating mergers and acquisitions.

And unlike vanilla desktop-as-a-

THE COMPANY

Citrix Systems

Headquarters: Santa Clara, Calif.

Employees: 6,936

2011 Revenue: \$2.21 billion

CEO: Mark Templeton

What They Do: Citrix offers products for virtualizing desktops, servers and applications, along with products for building private or public clouds. The lineup includes XenDesktop for desktop virtualization, NetScaler for cloud networking, and CloudPlatform for cloud computing. Its portfolio also includes GoTo collaboration services.

service offerings, Citrix says, Project Avalon will deliver a personalized workspace to end users by ensuring that user profiles, settings and application data are securely delivered to every user.

"I saw a demo of Project Avalon and thought it was pretty cool," says Chris Moses, CTO at independent broker-dealer E.K. Riley Investments.

Running cloud-based desktops is an attractive proposition. Desktops require a lot of IT infrastructure, and being able to leverage cloud vendors' IT capacity and robustness would be a huge benefit, according to Moses.

However, security requirements will make it hard for a firm like E.K. Riley to move its desktops to the cloud, he cautions. "So while I like the Project Avalon concept, it's going to be hard for us to fully embrace something like that," Moses says.

Mikael Ricknas is a correspondent at IDG News Service.

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The new world of integrated retail has required upgrades in both IT infrastructure and organizational thinking, says **Keith Sherwell**, SVP and CIO at Sears Holdings.



Click & MORTAR

23

CIOs are merging online and offline retail to retain customers and reclaim the shopping experience

BY MARY K. PRATT



he smell of the perfume, the drape of the fabric, the grain of the leather—these sensory experiences are about the only advantage that brick-and-mortar retailers have over online stores when trying to sell merchandise. Unfortunately for traditional stores, today's shopper carries a smartphone that allows her to scan the price tag in the store and then buy the same thing online for less. The phenomenon, called “showrooming,” causes store managers to harrumph about the “scan and scam” shopper.

But what if physical stores had both: the sensory experience of a boutique plus the click-click shopping efficiency and seemingly endless inventory of Amazon.com? What if a sales associate could use a mobile device to order a garment in a different color or size right when the shopper is in the dressing room?

Many of the bellwether retail companies, such as The Home Depot, Lowe's, Macy's, Nordstrom, Sears and Staples, are spending millions of dollars on IT to bring online capabilities into stores. The tactics include adding in-store Web kiosks, arming sales associates with mobile devices such as iPads, and (paradoxically) encouraging shoppers to use their smartphones in the store.

But this approach is only one step toward an even more ambitious goal that pundits call “omnichannel” retail, which unites physical stores, e-commerce, mobile and social selling into

one seamless experience for the customer.

For Sears, that means customers can order products online and pick them up in stores. They can have online-purchased items shipped to them, and can return unwanted items at stores. They can get text messages alerting them to special deals, or use Sears smartphone or tablet apps to manage their shopping lists or find product reviews.

"Technology plays a massive part in delivering an integrated customer experience, so we're doing a lot more around servicing you as a customer and delivering products the way you want to be serviced," says Keith Sherwell, senior vice president and CIO for Sears Holdings.

Consider the role technology plays in how Sears works with a customer looking to buy a lawn tractor. That customer could start with his desktop PC to research which tractor is best for his yard, using the Yard Guru buying guide at Sears.com. Or he could use the Sears app on his smartphone, or in the store at a Web terminal or while working with a sales associate who might have one of the more than 400 iPads and iPod Touches deployed as part of a chain-wide pilot program.

Sherwell says Sears calls its approach "integrated retail," which in the past few years has required upgrades in both its IT infrastructure and its organizational thinking.

The CIO won't disclose how much money Sears Holdings has invested in omnichannel efforts across its brands, which include Kmart, but he acknowledges that hundreds of millions of dollars have been spent in hardware, software and infrastructure upgrades.

Those upgrades include adding Wi-Fi to improve smartphone connectivity in the stores. Sears is also experimenting with iPads and iPod Touches to give sales associates greater mobility and flexibility when helping customers. And it's retraining associates "to understand this integrated retail model and all the tools available to them," Sherwell says.

How far along is Sears in its quest for integrated retailing? Sherwell says that "we're already most of the way there...and it's going to get better."

The New Normal

For decades, brick-and-mortar stores were information deserts, devoid of customer-facing technology, while consumers raced ahead, shopping online and adopting smartphones, says Greg Girard, analyst at IDC Retail Insights (a unit of CIO's parent

Taking IT to a New Level

To win the retail game, CIOs will need to focus on the customer experience and collaborate in the C-suite



or generations, differentiation in the retail industry was based on two things: price and location.

Technology has changed all that, says retail IT consultant Cathy Hotka. "What it means to be a retailer has fundamentally changed. It's now about the [customer] experience and the promise of the brand," she says.

Techno-futurist Daniel Burrus says retailers will have to be more thoughtful than they have in the past about how they distinguish themselves from each other. "There are many ways to compete. Many think it's on price, but Apple does well and it has never had the lowest price," he says. "You can compete on price, reputation, image, service, quality, design, time and speed, values, experience, innovation, and knowledge."

Technology will be crucial to each of those differentiators, Burrus says. "Today's CIO is an essential part of strategy creation because there are things that we can do now that we couldn't do even a year ago," he says.

But if the CIO wants to be involved in coming up with breakthrough strategies, he or she will have to break through some mental and organizational barriers, Burrus warns.

Retail CIOs who want to successfully develop and deploy the right IT infrastructure must work with other executives to address all possible points that can be used to differentiate the company from other retailers. Burrus says that kind of strategic planning requires more than just cooperation at the C-level: It needs a new level of collaboration.

"Cooperating is when you protect your piece of the pie; collaborating is when you work together to grow the pie, and omnichannel is about making a bigger pie for all. It's not about focusing on the website or social media. It's about focusing on the customer," he says. "This all involves data management and lots of integration. It means talking to leaders of all channels so you can work together to create a seamless experience for the customer."

Despite the crucial role technology plays in retail today, Kasey Lobaugh, a principal at Deloitte Consulting, says some retailers aren't treating the CIO as a strategic partner.

"Technology can drive the shopping experience. That's new in retail," he says. "But across my clients, I see some [IT departments] who have a seat at table and some who are still treated as a cost center instead of a strategic investment."

Those retailers are in for trouble, Burrus says. "The pressure to have a truly omnichannel, customer-centric experience is there, and it's becoming more glaring if you don't do it. If it can be done, it will be done, and if you don't do it, someone else will."

—M.K.P.

company). Now, he says in a report, "the most successful strategy to defend stores from becoming showrooms is to bring them into the mainstream of omnichannel commerce and transform them into centers of omnichannel orchestration."

The term "omnichannel" creates some confusion, though. "A lot of people will right away start thinking 'multichannel retailing.' Omnichannel retailing is different," says Daniel Burrus, founder, president and CEO of Burrus Research Associates.

"Omnichannel is integrated, the other is not. An omnichannel approach provides a very consistent experience regardless of the customer touch point and supports the brand and a uniform brand experience."

Retailers have a growing number of channels through which they can reach consumers—smartphones and tablets, websites, physical stores, kiosks, social media and smart TVs—and they have tended to manage each one as a separate activity. But customers now move fluidly between those channels.

"A consumer might research a product online, look at it up close in a store, solicit opinions from friends via social networks, use a mobile phone to check competitors' prices, but ultimately buy it in-store using PayPal on their phone," says Jeffrey Grau, an analyst at eMarketer. "What will matter most is whether the experience was smooth. If the retailer disappoints the shopper during any of these channel handoffs, it will reflect poorly not only on that channel, but on the brand as a whole."

A Long Journey

But the retail industry has a long way to go before it gets to that full-fledged omnichannel experience. "True omnichannel is really rare," says Cathy Hotka, who runs a retail IT consultancy.

The obstacles to reaching that goal are both technical and organizational, she says. Many retailers built up their online operations as separate organizations—and in some cases, actual

separate dotcom companies—so their physical stores and their Internet sites have different IT systems that may not work well together. As a result, some retailers still manage their online and offline retail inventories differently, and some even have different pricing policies.

"Retailers also still struggle with who should get credit for a sale. So if you get something online and I return it to the store, does the store take a hit for a customer having taken it back? You'd think for 2012 that would be solved," Hotka says.

Meanwhile, some retailers don't have an accurate view of their actual inventory, which is a huge problem for omnichannel practices, Hotka says. It means a sales associate can't scan a barcode to search the company's online inventory for an item in a desired color or size when it's out of stock at the store. It also means that the retailer can't offer same-day pickup for online orders, and in-store consumers can't easily access the store's online reviews to help them decide on a purchase.

"Retailers understand they have to get everything sorted out and integrated, but that doesn't mean they are. There's a lot of this work that has yet to be done," she says.

That work isn't cheap. "You're talking about hardware, networking, security, interoperability, multi-protocol networks. It's a lot to make sure they have the bandwidth they need today—and think about the kind of bandwidth they need tomorrow," Hotka says.

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John Dettenwanger Jr., CIO at Ahold USA, says omnichannel retail means breaking down the silos that separate brick-and-mortar shopping and the Internet.



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In a Wall Street earnings call, Nordstrom announced plans to spend nearly \$1 billion over five years on upgrading its digital operations, which gives an indication of just how expensive the task really is.

Nordstrom—which analysts say is a leader in omnichannel retailing—has distributed 6,000 handheld devices (modified iPod Touches) so store employees can ring up customers in the aisles and email them receipts, just like at Apple stores. It has had a single inventory-management system supporting stores and the online business since 2009. And it has a mobile shopping app that lets customers scan an item's barcode to check on its availability and browse styles based on personality types.

"It's about meeting and exceeding customer expectations no matter how they choose to shop," says Nordstrom spokesman Colin Johnson.

Kasey Lobaugh, a principal at Deloitte Consulting, says investments like that are bringing the retail industry closer to omnichannel. "We should envision a time when every customer is constantly connected, when they can be in the store and online at the same time connected by their mobile device, so then the two shopping experiences aren't disparate," he says.

Some consumers are already there: According to Deloitte's survey of 2,598 smartphone users, 58 percent use their smartphones to shop. And 61 percent of those who use smartphones

to shop use them while actually in a store. Some 52 percent use them on the way to the store, while another 45 percent use them on the day or night before shopping.

That usage pattern seems to correlate with sales, too, according to the survey. It found that 72 percent of the smartphone owners who used their devices on their last shopping trip actually made a purchase that day, compared to 63 percent of those who didn't own smartphones or who didn't use their devices while shopping.

Merging the Digital and the Physical

"When you start to treat [the experience] as a singular organization rather than channels, and you think about inventory as a singular concept versus store or online, it unlocks a ton of value for consumers and for the retailer as well," Lobaugh says.

"It's really the convergence of the digital and the physical. That's really omnichannel. But you have to get over the paradigm that the online business is about a Web page and a disparate experience and mobile is just a website on a smaller device. It's more about the capabilities to drive the experience."

This new way of thinking creates tremendous pressure on the technology organization, because convergence of the digital and the physical means the IT department—indeed, the whole company—needs to think differently about its technology.

PHOTO BY PETER MURPHY

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"It has to fuel the business, not just online shopping, so the entire stack of IT systems has to be re-evaluated," Lobaugh says. "You have to invest for a world in which digital is a fundamental for every point of contact. Omnichannel is ubiquitous. It's so fundamental to a retailer's future strategy."

That message is heard loud and clear at Ahold USA, the \$24 billion parent company of several regional grocery chains, including Giant Food Stores, Martin's Food Markets and Stop and Shop, as well as the online Peapod store.

"Customers are going to define how they want to shop, and if we're not enabling that, we'll become irrelevant," says John Dettenwanger Jr., CIO at Ahold USA. "To me, omnichannel is really about omnipresence. It really flips the view from 'What's the advantage to us?' to 'What's the advantage to the consumer?' We try not to silo this as a brick-and-mortar or Internet issue. It's about creating a more seamless environment for the consumer."

Some of Ahold's stores have deployed Scan It, an in-store scanning device, and Scan It Mobile, which works with personal smartphones. The tools allow shoppers to scan and bag groceries as they shop, so they can just pay and go rather than waiting at registers to check out. Scan It users also have access to budgeting tools and exclusive offers.

Dettenwanger says that's just the start of what's coming. Shoppers soon will be able to order items, such as deli products, from

help. And from a consumer perspective, I'm in a busy world and I'm going to go where I get the biggest help."

Dettenwanger acknowledges that there are challenges to getting there. He says the company needs to standardize and modernize its technology—a task that has been pushed to the forefront because of the pressure to move toward omnichannel retail. And then there's determining how and when to roll out new capabilities to customers, who, despite their penchant for smartphones, still need time to digest all the possibilities.

"There's a change-management aspect with our consumers. [Retailers] have spent many years training them to act in one way, so we have to be judicious in how we roll capabilities out so we don't overload them too quickly and so it doesn't become confusing," he says.

That is the art behind this push toward omnichannel: using technology to enhance a customer's experience and drive sales without creating a clunky or cumbersome process.

Craig Young, vice president of IT for Verizon Wireless, says the company has been working toward omnichannel for several years, following an "Aha" moment when its own study found that more than 60 percent of customers were researching products online before heading into a store to buy.

Young says Verizon Wireless wanted to take the online research that its own customers were doing at the company's website and provide it in useful formats to in-store sales representatives so they could be as helpful as possible to shoppers. That's crucial, he says, because 80 percent of Verizon Wireless items are still sold in stores.

Now a sales associate will know, for example, what phones a customer recently viewed. In the future, as the company gets deeper Facebook integration, Young says the company will pull in information gleaned from social media sites to further tailor interactions to each customer.

In the past several years, Verizon Wireless has invested in its CRM tools, data warehousing and standardized pricing and inventory, all of which created a strong base from which to launch into omnichannel, Young says.

When the company is setting up new systems, he says, it has an eye toward omnichannel. For example, Verizon Wireless developed its Iconic Sales Portal two years ago. It was initially designed to handle the anticipated high demand for the iPhone 4, but now it can be used to support high-volume sales during launches of new iPhones or Android phones. Young says the portal serves as a platform for uniting retail stores with shoppers using online, call center and indirect sales partners. "It was a consistent and seamless customer experience," Young says.

That's the kind of shopper experience that retailers are aiming for, experts say. "You're seeing technology as the strategic enabler. You have to be everywhere your customer is, and you have to serve that customer on every device that customer wants to use," says Tom Litchford, vice president of retail technologies at the National Retail Federation.

Case in point: In fiscal 2011, the CEO of Home Depot added interconnected retail to the \$70 billion home-improvement retailer's list of core principles, which up until then included just three others—a passion for customer service, being the product authority for home improvement, and disciplined capi-

"Customers are going to define how they want to shop, and if we're not **enabling** that, we'll become **irrelevant**."

—John Dettenwanger Jr., CIO, Ahold USA

their smartphones and then pick them up at the store. Someday they'll be able to access store maps on their smartphones so they can easily find the row and shelf location of the items they want. They'll be able to view online 3-D images of items, so they can check out ingredient lists and nutritional items from anywhere, just as they would while picking up the actual item in the store. And they'll be able to create grocery lists by using their smartphones to scan barcodes of items they have at home.

Further down the line, Dettenwanger envisions rolling out a Guess My Order program, which will use customer data to help build their shopping lists—and help build brand loyalty.

"People are creatures of habit, and we can predict what you'll need to buy, so it will look at your history and it will tell you what you need," he says. "If we take that insight and turn it into real value, that's where it's really different. It's not just pushing stuff at [customers]; that's not what they want. They want more

tal allocation driving productivity and efficiency.

"We'd like to serve our customers whenever, however and on whatever device they'd like to use to buy from us," says CIO Matt Carey, who came to Home Depot from eBay in 2008 to help deliver on this vision.

Carey points out that the company now allows customers to return online purchases to stores and to pick up items bought online at stores—features that Carey says "people have come to expect, the table stakes."

Carey is pushing beyond basics, too, moving closer to true omnichannel retail by deploying mobile apps that tell customers where they can physically find their desired products in the store and offering computer users visibility into store inventory and pricing so "you're not wasting a trip to the store, you know it's there." Home Depot also lets stores to see each others' inventory so they can immediately help in-store customers locate what they need, even if it's in another location.

In late 2010, Home Depot rolled out 34,000 handheld devices with inventory lookup and voice communications capabilities for the sales associates. These devices are also used for remote checkout, for example, when stores need to quickly move lines of shoppers preparing for hurricanes, or when associates are helping customers buying Christmas trees from outdoor lots.

This year the company is rolling out 25,000 "junior versions" of the handheld devices, which will give more associates access

to the core functions, specifically inventory lookup and voice communications.

In both those cases, Home Depot is using Motorola hardware with applications primarily developed in-house, according to company officials.

As IT-enabled shopping experiences continue to evolve, Litchford sees retail as on the edge of a technology frontier. Ahead, he sees retailers engaging customers in whole new ways. A customer watching a smart TV that shows a leather jacket on an actor will be able to click the screen to find out where it's sold or will send a tweet that triggers a response from the customer's favorite retailer with some suggested items.

"Maybe they know me personally because I'm in their loyalty program, and they can go get the sales associate who helped me last time," he says. "Then there's all the augmented reality, companies playing with [virtually] putting clothes on me."

That's already here. This spring, Bloomingdale's launched a virtual try-on window outside its New York City store, where passersby who stop in front of the window see an image of themselves wearing one of six pairs of sunglasses. (For more on augmented reality, see "Cool Use for Hot Tech," Page 10.)

Welcome to the future, Hotka says. "It's nothing short of a complete, fundamental disruption of how shopping works." **CIO**

Mary K. Pratt is a freelance writer based in Massachusetts.

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Muggles Get Magical

After seven books and eight movies, Universal Studios now offers a new way to experience Harry Potter: the 20-acre Wizarding World of Harry Potter section of the Islands of Adventure theme park. Thierry Coup, SVP of Universal's Creative Studio, says the company wanted to re-create the world of Harry Potter as realistically as possible. "We've designed a completely new ride system to put guests right in the middle of the excitement and chaos of Harry Potter's life," he says. The marquee ride at the park is Harry Potter and the Forbidden Journey, which uses "robocoaster" technology from KUKA Robotics in Germany. The ride's seats are mounted on massive robotic arms that take passengers through the Hogwarts School of Witchcraft and Wizardry, where holograms of Harry and headmaster Dumbledore appear, and then through action sequences such as the Whomping Willow tree and a quidditch game projected onto 360-degree screens. "This has been the most successful attraction launch in our history," Coup says. *—Lauren Brousell*

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